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worm, the white-marked tussock-moth, and the fall web-worm are the insects discussed.—The *Proceedings of the Natural History Society of Wisconsin* for April devotes forty-two pages to a paper on the special senses of wasps, by G. W. and E. G. Peckham.

ZOOLOGY.

The Fauna of Liverpool Bay.—A short time ago, at the instigation of Professor W. A. Herdman, of Liverpool, England, the "Liverpool Marine Biological Committee" was formed, the object of which was to explore the fauna of Liverpool Bay and the adjacent seas. The first report of this committee has recently been published, and occupies three hundred and seventy pages, with ten plates and two maps, of vol. xl. of the "Proceedings" of the Liverpool Literary and Philosophical Society. Persons interested loaned tugs and steamers for the purposes of dredging, and the additions made to the knowledge of the fauna of the Irish Sea are very considerable. The specimens collected were turned over to specialists to work up, and from their reports and lists of species it has been found that of the nine hundred and thirteen species recorded, two hundred and thirty-five were new to the region embraced; sixteen were never before reported from the British seas, and of these seven species and three varieties are new to science. Of the special reports on the different groups we can only allude to Professor A. Milne Marshall's excellent sketch on shallow-water faunas, and that of the Rev. H. H. Higgins on pioneers in local biology. Professor W. A. Herdman in a supplementary paper deals with variability in the tunicates, while J. H. Gibson discusses the systematic value of the spines of the polychætous worms, coming to the conclusion that they are of but moderate importance. There are a few notes on the attempted introduction of the quahog (*Venus mercenaria*), which does not appear to have been successful. Among the projects outlined for the future is a systematic examination of the fauna between tide-marks. This littoral zone is to be divided into belts, corresponding to its elevation above low-water mark, and each belt is to be examined separately with a view of ascertaining, among other points, the daily submergence which each species requires.

The Systematic Position of the Sponges.—Dr. G. C. J. Vosmaer, in the concluding portion of his volume on the Porifera in Bronn's "Klassen und Ordnungen des Thierreichs," discusses the various views held as to the relationships of the sponges, and advances some ideas of his own, which, from his familiarity with the subject, are worthy of attention. He divides the sponges

into two great groups, Calcareæ and Non-Calcareæ, maintaining that the two are perfectly distinct, and that there are no osculant forms. He divides the Non-Calcareæ into Hyalospongiæ (=Hexactinellidæ *Auct.*), Spiculispongiæ, and Cornacuspongiæ, the limits between which are not so distinct as those between the groups first mentioned.

As to the origin of the sponges, Vosmaer claims that our embryological knowledge is still insufficient to decide, but still that there is some reason for the belief that their ancestor was a free-swimming form, which may have been like the larva of some silicious sponge. The larva of *Sycandra* is too aberrant to hold the position of representative. First to be settled is the point whether the sponges are to be regarded as Protozoa, Cœlenterates, or an independent group. Vosmaer takes the latter view, and quotes in support Balfour, Heider, Bütschli, and Sollas, but fails to refer to Hyatt, who antedates them all in holding this opinion. His reasons are both structural and embryological. He fails to see that the sponges are degenerate Cœlenterata,—as is held by most continental students,—and claims that while the silicious sponges are degenerating, the Calcareæ and the Cornacuspongiæ are advancing. In development the Spongiæ and the Cœlenterata have nothing in common beyond the gastrula stage. That the sponges have indirectly descended from the Protozoa Vosmaer thinks probable, but he is at a loss for the transition stages, as he does not accept the views of the late Henry James Clarke, which, by the way, he attributes to Saville Kent. Balfour's amphiblastula theory is dismissed with few words as set aside by Heider, while Heider's own theory receives scarcely more mention. For himself he has now new ideas to advance. He thinks that the first sponges were deep-sea forms, and ultimately developed a stony silicious skeleton, which degenerated to at least a considerable extent when the forms entered shallower cases.

Parasitic Sea-Anemones.—Prof. A. C. Haddon enumerates (*Sci. Proc. Roy. Dublin Socy.*, v. pp. 473–481, 1887) the known parasitic larvæ of the genera variously known as *Bicidium*, *Peachia*, *Philomedusa*, and *Halcompa*. This group is known on our coast by a form first described by Mr. Alexander Agassiz as *Bicidium parasiticum*, but which has since been referred to the two genera *Peachia* and *Philomedusa*, the latter of which will now have to lapse into synonymy. *Peachia parasitica* is a small sea-anemone an inch or two in length, which is usually formed, as its name implies, parasitic in the folds around the mouth of the large brown or purple jelly-fish, *Cyanea arctica*. Haddon has some remarks on the number of tentacles and mesenteries in these forms, which lead him to the conclusion that the three families in which these parasitic sea-anemones occur are more

closely related than is usually thought to be the case. A detailed account of the British species of *Halcampa* is promised.

Chætonotus.—Dr. A. C. Stokes has catalogued the American and some of the foreign species of *Chætonotus* in the *Microscope* (vol. vii. pp. 1 and 33, 2 pls., 1887). Of the species twenty are enumerated. *Chætonotus sulcatus*, *concinmus*, *loricatus*, *rhomboides*, *spinifer*, *acanthodes*, *octonarius*, *spinulosus*, *longispinosus*, *enormis*, and *acanthophorus* (11) are described as new from New Jersey. *Ch. podura*, *maximus*, and *larus* of Ehrenberg are regarded as common to both Europe and America, while the other six species catalogued have not been seen by this observer in America. The paper is preceded by a few notes on their anatomy and a few observations upon their eggs, which pass through their development, from segmentation to hatching, in thirty hours. Dr. Stokes, it may be said in passing, unites *Ichthyidium* with *Chætonotus*, a step of doubtful propriety, while no mention is made of the other genera of the class *Gastrotricha*, to which these worms belong. Dr. Stokes's paper has been reprinted in Pelletan's *Journal de Micrographie*.

Anatomy of Pseudoscorpions.—Croneberg gives (*Zool. Anzeiger*, No. 246) a preliminary account of the anatomy of *Chernes*, one of the Pseudoscorpions. The sucking pharynx is moved by dilator muscles, the contraction being effected by the elasticity of the strongly chitinized wall. The œsophagus is narrow, but widens out for the short stomach, and then at once contracts to form the intestine. With the stomach are connected the three (one medium, two paired) hepatic sacs, the lateral ones being divided into eight secondary lobes. The unpaired and inferior sac, among other substances, secretes a chalky-white substance which forms the exclusive contents of the intestine. The brain, heart, and genitalia are described. Croneberg, however, could find no traces of the spinning-glands described by Menge as occurring at the tip of the abdomen, where indeed he thinks it would be poorly adapted for the animal's needs. Croneberg rather seeks the spinning organs in two glands above the brain, the ducts of which terminate at the tips of the movable joints of the chelicerae. Menge claims to have witnessed these animals spinning their small protective webs, but this Croneberg does not appear to have seen.

Description of a New Species of Fruit-Pigeon (*Fanthenas jouyi*) from the Liu Kiu Islands, Japan.

Fanthenas jouyi, sp. nov.

DIAGNOSIS: Similar to *Fanthenas ianthina* (Temm.), but with a large white patch on the lower hind neck and the anterior portion of the interscapilium; metallic reflections on scapulars and back bronzy green, not purple as in *F. ianthina*.

DIMENSIONS: Wing, 253 mm.; tail-feathers, 188 mm.; exposed culmen, 23 mm.; tarsus, 35 mm.; middle toe, with claw, 51 mm.

SYNONYMY: *Carpophaga ianthina* Seebohm, Ibis, 1887, p. 179 (*part*).

HABITAT: Liu Kiu Islands, Japan.

TYPE: Tokio Educational Museum, C. Tasaki coll., February 3, 1887.

Other specimens of this very distinct species have been obtained by Mr. H. Pryer's collectors in the Liu Kiu Islands. I take great pleasure in dedicating it to my friend, Mr. P. L. Jouy.

I wish also to express my indebtedness to the authorities of the Tokio Educational Museum for the opportunity to describe this interesting novelty.—*Leonhard Stejneger*.

ZOOLOGICAL NEWS.—PROTOZOA.—J. H. Siddall, in his report on the Foraminifera of the Liverpool Marine District (*supra*), gives the following account of the method of collecting these forms. Foraminifera, he says, "may always be got by carefully scraping the surface of the velvety brownish mud at the bottom of pools left by the tide. . . . The oozy mud may be got rid of by washing through a fine muslin net, and the residuum put into small bottles filled with sea-water. The bottles should be kept uncorked in a cool place, out of direct sunlight, when the Foraminifera will creep up the sides of the bottle and live there for months."

SPONGES.—Prof. P. Martin Duncan and Dr. G. J. Hinde are having an animated discussion in the pages of the *Annals and Magazine of Natural History* over the name to be applied to the fossil sponge Hindia of Tennessee.

Mr. H. J. Carter (*Ann. and Mag. N. H.*, April, 1887) describes a new species of fleshy sponge from Australia under the name *Chondrosia spurca*, which is remarkable from the immense amount of foreign material (more than half its bulk in one instance) which it incorporates in its tissues.

VERTEBRATA—FISHES.—*Linophryne lucifer*, recently described in the *P. Z. S. of London*, by Robert Collett, is a singular, small Ceratian with an enormous head and mouth, a single cephalic tentacle to represent the spinous dorsal; immensely long and slender teeth on the jaws and vomer (also teeth on upper pharyngeals); very narrow gill-openings; very short soft dorsal and anal, and no ventrals. The abdominal cavity forms a sac suspended from the trunk, and projecting backward beyond the tail. There is a long tentacle on the throat. The specimen was taken off Madeira.

G. A. Boulenger has recently described a *Ctenopoma*, a *Clarias*, and a *Mormyrus*, from the Lower Congo. All have native names; also three new South American Characinoids.

REPTILES AND BATRACHIA.—Mr. G. A. Boulenger describes a new Calamaria, from Borneo, in the *Annals and Mag. Nat. Hist.* (March). He also notes that *Elaphis grabowskyi* Fischer, from Southeastern Borneo, is identical with *E. taeniurus* Cope. The latter snake has a wide range, since specimens have been obtained from Pekin, Darjeeling, Siam, and Sumatra.

Mr. G. A. Boulenger makes some remarks (*Ann. and Mag. Nat. Hist.*, March) upon the fresh-water turtle recently described by Mr. E. P. Ramsey in the *Proc. Linn. Soc. N. S. W.* This tortoise (*Carettochelys*) was obtained in the Fly River, New Guinea, and is stated to be one of the most striking discoveries made in recent herpetology during the last twenty years. It differs from all fresh-water turtles by the structure of the limbs, which form regular paddles, and have only the two inner digits clawed. Epidermic scutes are absent. Mr. Boulenger makes it the type of a family of Pleurodira,—*Carettochelydidae*.

G. A. Boulenger has recently described *Rana martensii*, from Japan; *Ixalus asper*, from Perak; and *Geomolge fischeri*, from the river Ussuri, in Mantchuria. Also a new frog, of the genus *Megalophrys*, from Perak.

BIRDS.—Mr. F. E. Beddard states that the air-sacs of *Casarius* resemble those of *Apteryx* much more closely than those of *Rhea*.

The same anatomist has examined the structure of the syrinx in various Caprimulgidae. Though the Guacharo (*Steatornis*) stands alone in having a purely branchial syrinx, yet *Podargus* and *Batrachostomus* are transitional between *Steatornis* and other Caprimulgidae.

Those interested in pterography will find, in the *Proceedings Zool. Soc. London*, April, 1886, a valuable paper, with illustrations, upon the disposition of the cubital coverts. Mr. Goodchild remarks that, up to a certain point, there is a remarkable correlation of particular styles of imbrication of the cubital coverts with certain structural peculiarities,—osteological, myological, visceral, and pterographical.

Mr. H. B. Tristram (*P. Z. S.*, January, 1886) describes *Dafila modesta*, a fourth species of the genus, from Sidney Island, Phoenix Group (lat., 4.30° S.; lon., 171.20° W.).

Mr. P. L. Sclater has described a new flamingo (*Phænicopterus jamesi*), from Tarapaca, Chili. Three specimens were obtained by Carlos Rahmer, at a height of about twelve thousand feet, at the foot of the Tsluga Volcano. The bill is shorter and smaller than in *Ph. andinus*, the naked space at the lores wider, the upper mandible narrower, and there is less black at the tip. The legs of the species are red.

MAMMALS.—The British Museum has lately received, along with the magnificent collection of East Indian birds donated by

Mr. A. O. Hume, about four hundred examples of mammals, referable to two hundred and six species. The collection is geographically valuable, since it comprises four separate series, obtained, respectively, at Sambhur in Rajpootana, Manipur (northwest of Birmah), Tenasserim, and the Malay Peninsula. Sambhur fixes the limit at which the fauna begins to lose its ordinary Indian character, and to show signs of the desert character of Sind and the Punjab. *Felis chaus*, *F. torquata*, *F. ornata*, *Viverricula malaccensis*, *Paradoxurus niger*, *Herpestes griseus* and *H. smithii*, and *Mellivora indica* occur among the specimens. The Manipur fauna is decidedly Himalayan. A new variety of *Herpestes auro-punctatus* and a new *Mus*. (*M. humei*) are the novelties, and *Sciurus indicus* has its known range extended from Nepal to Manipur. *Semnopithecus femoralis* is added to the Tenasserim fauna, and among the Malay specimens is a beautiful new *Sciuropterus* (*S. davidsoni*).—*P. Z. S.*, January, 1886, Mr. O. Thomas.

Mr. R. A. Sterndale notes the certain occurrence of a natural hybrid between *Ovis hodgsoni* and *O. vignei*, due to a ram of the former and larger species appropriating the ewes of a herd of the latter. The ram was killed by wolves, and in course of time the hybrids, crossed with *O. vignei*, showed signs of reversion to that type.

Part I. of vol. clxxvi. of the *Philosophical Transactions of the Royal Society of London* contains two portions of W. K. Parker's work upon the structure and development of the skull in the Mammalia. The first part is devoted to the Edentata, the second to the Insectivora. Thirty-nine plates illustrate these treatises.

Mr. O. Thomas describes (*Ann. and Mag. Nat. Hist.*, February) *Pseudochirus forbesi*, a new Papuan phalanger similar to *Ps. canescens* Waterhouse. An adult male was 280 mm. long without the tail, which measured 230 mm. It was found in the Astrolabe Mountains of Southeastern New Guinea, at a height of two thousand feet.

Mr. Thomas also diagnoses *Nesonycteris woodfordi* and *Pteropus grandis*, two new fruit-eating bats from the Solomon Islands.

Dr. Monticelli contributes to the *Proceedings of the London Zoological Society* a list of the South Italian Chiroptera, including eighteen species.

Mr. O. Thomas has described and figured, in the *Proc. Zool. Soc.*, two skulls of *Mustela pennanti*, which, though both adult, exhibit variations such as have often given foundation for the description of new species. The development of the temporal muscles has expanded the zygomatic arches, absolutely constricted the anterior part of the skull, and narrowed the posterior narial passage in the older skull.

One of the most singular of rodents is *Heterocephalus phillipsi*, from Somali-land. It is of about the size of a mouse, but, from its hairless skin, small eyes, and peculiar head, looks more like

a tiny puppy. The ears are simple, round holes, without a conch, and the eyeballs are barely half a millimetre in diameter. Another species, *H. glaber*, was described by Rüppell forty years ago. It is a burrower, the skin passing across the mouth inside the incisors.

EMBRYOLOGY.*

Suggestion respecting the Epiblastic Origin of the Segmental Duct.—In a recent paper² with the above title, Prof. A. C. Haddon, of Dublin, offers a very suggestive explanation of the origin of the paired parallel segmental ducts of vertebrates from lateral, longitudinal grooves in some primitive, ancestral form, these grooves finally closing so as to form lateral ducts, which, at last, became confluent posteriorly with the cloaca.

Professor Haddon cites Hensen, Spee, and Flemming as having observed the origin of the segmental ducts from the epiblast in the rabbit and guinea-pig. Later (1886), Dr. Van Wijhe found the same to be the case in *Raia clavata*, and afterwards Dr. Perényi observed the same mode of development to obtain in *Rana esculenta* and *Lacerta viridis*.³

"The origin of the segmental duct from the epiblast being now known to occur in Elasmobranchs, Anura, and Rodents, we are justified in assuming that this is a general and probably primitive mode of formation. With the above-mentioned exceptions, all embryologists who have recorded observations on the development of the duct agree in stating that it is at first placed immediately below the epiblast, and that it gradually sinks within the mesoblast until it comes to lie close to the peritoneal epithelium; they also all agree in deriving the duct from the somatic mesoblast.

"The duct arises, in the Rodents, as a linear proliferation of the epiblast, in the region opposite to the intermediate cell-mass ('*Grenzstrang*' of Hensen). Flemming points out that the area is of variable length, not even being symmetrical. The separation of this solid cord of cells from the epiblast takes place from before backwards, and first occurs at a time when the mesoblastic somites are still entirely continuous with the ventral (somatic and splanchnic) mesoblast. Hensen, Spee, and Flemming conjectured that the primitive kidney is itself developed from the epiblast in these mammals; but of this they produce

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² The Scientific Proceedings of the Royal Dublin Society, v., pt. vi., 1887, pp. 463-472, pl. x.

³ [The editor would here, for the first time, record the fact that he has found the anterior ends of the segmental ducts intimately connected with the epiblast in young embryos of the catfish (*Amiurus albidus*), so that the mode of origin of the segmental duct spoken of above very probably applies also to the Teleostei.]